

and vinegar. The mineral called graphite or blacklead, is almost pure carbon, and the diamond is but perfectly pure and crystalized carbon. When united in certain proportions to oxygen, it then loses its solid, assumes the gaseous form, and performs a most important part in the process of vegetation. The compound thus formed is called *Carbonic acid*, it extinguishes burning bodies, and even in moderate proportion is fatal to *animal* life. Where combustion does not take place from the presence of carbonic acid, animal life cannot exist. It is the presence of this gas which causes the impurity of air in wells, and hence the custom of letting down a lighted candle before persons will venture to descend. If the candle goes out the air is certainly impure, and persons cannot encounter it with safety; and even when it exists in quantities not sufficient to put out the candle, yet enough may be present to produce serious and even fatal effects to those who encounter it. The injurious effects of this gas in wells can be obviated by pouring into them a plentiful supply of quick-lime, in water.

Although when breathed it proves so noxious, yet when taken into the system by other means, its effects are quite agreeable.

It is this which gives to the different artificial mineral waters their pungency, and to ale, porter and some kinds of wine, their pleasant flavor, which being lost by exposure to the air, renders them stale, tasteless and flat. Water absorbs it readily, and thereby acquires the ability of dissolving the mineral or inorganic constituents of soils; a most important property as we shall hereafter see.

It is always exhaled from the lungs of animals during respiration, and is formed by the burning of wood and coal; it is emitted from volcanoes, and is also a constant product of the decay of vegetable and animal matter, and therefore always exists in the atmosphere.

Since its sources are so constant and so abundant, the inquiry naturally presents itself, how is it that it does not accumulate in sufficient quantities to render the air unfit for the purpose of breathing. Here the science of Chemistry unfolds at once the Beneficence and Wisdom of the Creator in a most striking and wonderful manner. This wisdom and goodness is moreover manifested by means so perfect, and withal so simple as to call forth our highest admiration of, and our greatest adoration and gratitude to Him who employs them for our good.

"Whenever it is vouchsafed to the feeble senses of man to cast a glance into the depths of creation, he is compelled to acknowledge the greatness and wisdom of the Creator of the world. The greatest miracle which he is capable of comprehending, is that of the infinite simplicity of the means, by the co-operation of which order is preserved in the universe, as well as in organism, and the life and continued existence of organized beings secured."

The causes which I have enumerated would, if not counteracted,